

SWS:Imp EWG-136 10/28/05

Patent

Amendments to the Claims:

1) (currently amended): A method of filtering data prior to reading a digital watermark that was inserted using a scale to black technique, said method comprising: projecting color values of each pixel onto a preferred projection axis that is adaptively determined by examining color of at least some of the pixels surrounding each pixel, wherein the preferred projection is adaptively determined from said examining and not through selection of a predetermined projection axis without such an examination, whereby watermark reading is aligned to watermark insertion, and reading the watermark from resulting data.

2) (previously presented): A system for reading a digital watermark from a digital image which includes a number of pixels, each pixel being defined by a set of numbers representing color components of the particular pixel, said system comprising: a filter for calculating a value of each pixel along a preferred projection axis, the preferred projection axis corresponding to a direction of embedding determined based on color characteristics of at least some pixels associated with each pixel; and a watermark reader which operates on the values calculated by the filter.

SWS:imp EWG-136 10/28/05

Patent

- 3) (previously presented): A method of calculating values that will be used to read a watermark from a digital image, wherein the digital image comprises a plurality of pixels, said method comprising:
- projecting color values of each particular pixel to a preferred projection axis, said preferred projection axis being determined by averaging at least some color values of pixels in an area adjacent to a particular pixel; and
- providing results of said projecting.
- 4) (previously presented): The method recited in claim 1 wherein pixels in an area of three by three pixels are examined to determine the preferred projection axis.
- 5) (previously presented): The method recited in claim 1 wherein said watermark has a particular tile size and wherein pixels in an area of said tile size are examined to determine the preferred projection axis.
- 6) (previously presented): The system recited in claim 2 wherein said filter examines pixels in an area of three by three pixels to determine the preferred projection axis.
- 7) (previously presented): The system recited in claim 2 wherein said watermark has a particular tile size and wherein said filter examines pixels in an area of said tile size to determine the preferred projection axis.

SWS:Imp EWG-136 10/28/05

Patent

- 8) (previously presented): The method recited in claim 3 wherein pixels in an area of three by three pixels are averaged to determine the preferred projection axis.
- 9) (previously presented): The method recited in claim 3 wherein said watermark has a particular tile size and wherein pixels in an area of said tile size are averaged to determine the preferred projection axis.
- 10) (canceled).
- 11) (previously presented): A system for reading a digital watermark in an image that comprises a number of pixels each represented by a set of numbers representing different colors, said system comprising:
a filter which projects the set of numbers representing color of each pixel onto a preferred projection axis by averaging color values of pixels of a particular area, and
a watermark reading program for reading said watermark from said preferred projection axis.

SWS:lmj EWG-136 10/28/05

Patent

12) (currently amended): A system for reading a digital watermark from a color image that comprises a number of pixels each having multiple color components, said system comprising:

means for adaptively filtering the color image to project color components of each pixel to a preferred projection axis, wherein projecting color components is based at least in part on local color content of the color image for an image area that is associated with each pixel; and

means for reading the watermark from the filtered image.

13) (currently amended): A method of reading a digital watermark from a color image that includes a plurality of pixels and which was watermarked using a scale to black watermarking technique, said method comprising:

filtering the color image to generate filtered data by projecting color values of each pixel onto a selected axis that is determined by examining color of surrounding pixels and not through filtering with a predetermined process without an examination of the color values, and

reading the watermark from resulting filtered data.

14) (previously presented): A method of reading a digital watermark from a digital image that includes a number of pixels, each pixel of the numbers of pixels being defined by a set of numbers representing color components, said method comprising: filtering the set of numbers that represents each pixel by projecting the set of numbers to a selected axis, wherein a direction of said selected axis is determined by examining color

SWS:hmp EWG-136 10/28/05

Patent

values of pixels in an area associated with each pixel, and wherein said filtering provides results; and

reading said watermark from the results providing by said filtering.

15) (previously presented): The method recited in claim 14 wherein said filtering determines the direction of said selected axis for each pixel by examining values of pixels in a three by three area surrounding each pixel.

16) (previously presented): A watermark reading method for reading a watermark that has been inserted into a luminance value of pixels of an image by projecting color changes needed to embed the watermark onto a luminance axis of each pixel, said method comprising:

filtering the image prior to reading the watermark by first projecting color values of each pixel onto a preferred projection axis that is determined by examining color values of predetermined pixels, wherein at least the values are used to determine a direction of the axis; and

reading the watermark from data associated with a result of said filtering.

17) (previously presented): A method of inserting first and second watermarks in an image comprising:

inserting a first watermark in an image in a first color direction, wherein the first color direction is determined, at least in part, through consideration of localized color characteristics associated with different sets of pixels in the image; and

SWS:Imp EWG-136 10/28/05

Patent

inserting a second watermark in a color direction that is orthogonal to the first color direction.

18) (previously presented): A method of reading two orthogonally inserted watermarks from an image, wherein the image comprises a plurality of pixels, said method comprising:

filtering the image to project each pixel of the plurality of pixels onto a preferred projection axis, wherein the preferred projection axis is determined at least in part by an average color of associated pixels;

reading the first watermark from data resulting from said filtering;

projecting each pixel onto an axis that is orthogonal to the preferred projection axis; and
reading the second watermark from resulting data.

19) (previously presented): The method recited in claim 17 wherein an intensity of the second watermark is lower than an intensity of the first watermark.

20) (previously presented): A method of filtering an image containing a digital watermark to generate a set of values from which the digital watermark can be read, wherein the digital watermark is inserted along a particular color direction, said method comprising:
approximating a plurality of color directions that the digital watermark is likely embedded along through analysis of a plurality of local color characteristics of the image;
and

SWS:imp EWG-136 10/28/05

Patent

searching for the digital watermark in the approximated color directions.

21) (canceled).

22) (new): The method of claim 2 wherein the preferred projection axis is determined based on color characteristics of at least some pixels associated with each pixel and not through a predetermined projection axis without such a determination of color characteristics.

23) (new): The method of claim 22 wherein the predetermined projection axis comprises a luminance axis.